

# A framework for mobilizing private finance and tracking the delivery of adaptation benefits

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## Abstract

Over the last decade, there has been the growing expectation from the international community that the private sector will become an important source of finance for climate change adaptation in developing countries. However, this potential still remains unclear. While it is expected that some private actors will purposefully or unconsciously invest in reducing their own vulnerability, it is far less obvious how the public sector can mobilize private investments in adaptation that deliver benefits to the broader community. This paper presents an empirically-driven, conceptual framework that allows users to create an overview of enabling environments, mobilization, and delivery of finance for adaptation benefits at the national level. The framework was tested in two countries in Sub-Saharan Africa: Kenya and Rwanda. While an enabling environment is an important first step for mobilization of private finance, as often argued in literature, it is also crucial to enforce existing policies and consistently install and apply safeguard mechanisms, as well as to create awareness of climate impacts among private sector actors. Otherwise, the high expectations around the private sector's financing of adaptation will not be met, which would leave communities, businesses and countries vulnerable to climate change.

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## 1. Introduction

The need for investments to address climate change is daunting. For instance, by 2030, trillions of dollars (US\$) are needed just for the global transition to low-carbon and climate-resilient infrastructure (Global Commission on the Economy and Climate 2016). In developing countries, where socio-economic conditions and limited infrastructure exacerbate vulnerability to climate change, investment in adaptation is particularly critical (IPCC 2018). Globally, public and private investments into climate-related activities are increasing. In 2014, the public and private sectors invested a combined US\$391 billion (Buchner et al. 2015). However, as much as 92% of private finance stays in the country where it originates. This share, borne by domestic private finance, raises the question: to what extent can international private finance support developing countries? Moreover, private investments in adaptation are not included in this number, because it is difficult to track or, in many cases, even to identify private finance flows for adaptation (Atteridge and Dzebo 2015; Pauw et al. 2016). It is therefore unknown to what extent the private sector might address the costs of adaptation in developing countries, which could rise to between \$140 billion and \$300 billion per year by 2030 (UNEP 2016).

The private sector plays a critical role in contributing to developing countries' growth and development efforts. In Africa, for example, the private sector comprises almost 67% of the continent's investment, 75% of its economic output, and 90% of its formal and informal employment (AfDB 2013a). In this paper, private sector refers to large international and domestic corporations, as well as micro, small, and medium-sized enterprises (MSMEs).

To support developing countries with their mitigation and adaptation efforts, developed countries pledged to mobilise US\$100 billion per year by 2020 under the United Nations Framework Convention on Climate Change (UNFCCC). The private sector has also been mentioned as a potential source for climate finance to support developing countries with their mitigation and adaptation efforts (UNFCCC, 2009; 2015). This notion of non-state climate action – where private companies, civil society, cities, municipalities and other non-state actors govern climate change with and without nation-states – has been increasingly prominent in climate governance (Biermann et al. 2009; Bulkeley et al. 2014). However, climate change mitigation – not adaptation – has been the overwhelming focus of the so-called Global Climate Action Agenda (Chan et al. 2018). Private sector investment in adaptation often happens autonomously and without a clear intention to address climate change (Brink et al. 2016; Averchenkova et al. 2016; Juhola, 2013). Therefore, adaptation research in developing countries has focused mainly on public finance, households and communities, particularly in rural environments (Crick et al. 2018a).

But the private sector is exposed to various climate-related risks that may prompt action and investment in adaptation. These risks range from economy-wide risks to specific sectoral, industry or company-level risks. Adverse impacts of these risks can be direct, including damage to infrastructure and disruption of production processes; impacts can also be indirect, through disruption to supply chains and changes in regulations, product demand, and business reputation (Agrawala et al. 2011).

Finance for adaptation requires multiple layers of governance, including domestic and international actors and institutions; it also involves a plethora of national and sectoral policies, as well as various financial instruments to mobilize and deliver the funds. However, a structured governance approach to the challenges of private adaptation has yet to be developed. Adapting to climate change can't be resolved only through large-scale investments in infrastructure or technology transfers; it requires enabling policies and appropriate institutional environments for private sector actors (Crick et al. 2018b; Biagini and Miller 2013).

So how can countries understand and increase private sector contributions to the financing of adaptation activities? In order to address this question, this paper develops an empirically driven, conceptual framework for private adaptation finance and tests it in two countries in Sub-Saharan Africa: Kenya and Rwanda. The framework focuses on the interaction between three building blocks:

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This paper develops a conceptual framework for private adaptation finance and tests it in two countries: Kenya and Rwanda.

enabling environments, mobilization, and the delivery of finance for adaptation benefits. As part of the latter, we identify whether publicly mobilized private investments in adaptation also can contribute to the US\$100 billion pledge under the United Nation Framework Convention on Climate Change (UNFCCC). This paper's framework emphasizes the challenges developing countries face in order to identify what works for mobilizing private finance for adaptation – and, when mobilization is possible or identified, how to monitor the adaptation resulting from such funding. We focus on mobilized private adaptation that contributes to a public good, meaning the outcome is accessible to all citizens and can be enjoyed by many without reducing its availability (Hall and Persson 2017; Geaves and Penning-Rowsell 2016).

The framework was developed and improved incrementally through a mixed-method approach. This included: a literature analysis; discussion of the first draft with experts at a side event at the UN climate negotiations in Paris (the Conference of Parties, or COP 21); an application phase through fieldwork in Kenya and Rwanda, including 45 semi-structured interviews with 51 decision-makers and other key stakeholders (February/March 2016); and discussions on the results at a side event at the Marrakech Climate Change Conference (COP 22) and two workshops in Kenya and Rwanda (December 2016).

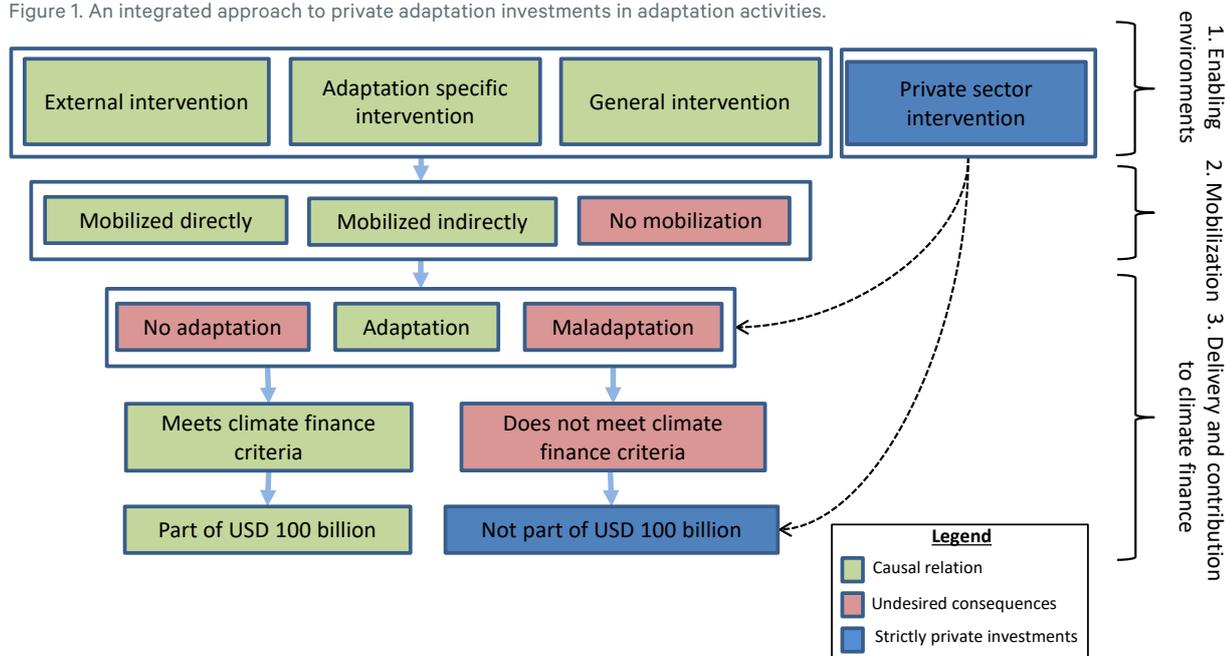
The next section introduces the framework. Section 3 presents the results of applying the framework in Kenya and Rwanda. Section 4 summarizes the strengths and weaknesses in current practices for mobilizing private finance for adaptation. Finally, the conclusion discusses the key benefits and challenges of applying this framework and provides recommendations for decision-makers.

## 2. The framework

This section discusses how to identify effective instruments for fostering an enabling environment that mobilizes private sector finance for adaptation. This is shown through a conceptual framework that consists of three key components: enabling environments, mobilization, and delivery of adaptation benefits (See Figure 1). The framework was developed by applying an institutional approach that captures the key processes of governance and emphasizes the roles of the public and private actors who contribute to decision-making and influence societal processes (Treib et al. 2007; Jordan 2008).

The purpose of the framework is to help users identify enabling environments in the context of a given country. The framework also helps identify interventions that are both successful and unsuccessful in mobilizing private investment, as well as examines to what extent these interventions are delivering (or not delivering) adaptation benefits. We argue that there is a causal relationship, where enabling environments should lead to increased mobilization and subsequent delivery of private finance for adaptation benefits (Figure 1) (See Miles et al. 2001).

Figure 1. An integrated approach to private adaptation investments in adaptation activities.



### Step 1: Identifying enabling environments

The first step of the framework is to identify which instruments and which institutions are aiming to create an environment that fosters private finance for adaptation. An enabling environment can be built with various sets of instruments. These can include (a) **policy and regulatory instruments**, intended to influence behaviour through mandatory or voluntary measures, such as standards, planning and zoning laws, property rights, licensing requirements, and restrictions on import and export; (b) **economic instruments**, intended to influence behaviour through price-based mechanisms, including taxes and levies, incentives and subsidies, direct investments, lending and guarantees, insurance, public procurement, and price controls and support; (c) **awareness-raising instruments**, intended to share and disseminate information and sponsor capacity-building, training and education, certification and labelling, and voluntary accounting systems; and (d) **data and technology instruments** which can enable investments by improving access to data and information in remote areas through the internet and mobile phones, for instance (Crick et al. 2018b; Ampaire et al. 2017; Stenek et al. 2013).

The framework suggests users consider four potential sources of instruments from institutions:

1. **Measures from external or international actors**, such as those from international development agencies or finance institutions that incentivise investments by international or domestic private sector actors. These instruments can be grants, (concessional) loans, insurance, export credits, risk guarantees, and non-financial instruments such as in-kind or technical assistance (Pauw 2017).
2. **Domestic instruments promoting private sector investment in adaptation**, such as building irrigation systems to address reduced water availability and developing early warning systems for climate-related extreme events.
3. **Domestic instruments that promote private sector investment in general, but also contribute to adaptation**, such as infrastructure improvements, investments in research, or policies intended to increase Foreign Direct Investment (FDI).
4. **Private sector instruments promoting private sector investment on adaptation**, creating an enabling environment for other private actors' investment in adaptation. For example, insurers or retailers may require their policyholders or suppliers to "climate-proof" their operations (see e.g. Jensen et al. 2017). While efforts to create enabling environments neither guarantee effective policies nor necessarily result in desired mobilization of investments, they are a precondition for achieving effective outcomes and subsequent impact (Easton 1965).

### Step 2: Mobilization

Instruments identified in Step 1 should be able to prove that they have successfully mobilized additional private investments. The framework, in line with Brown et al. (2015), suggests considering two types of mobilization: direct and indirect (Figure 1).

When private finance is directly mobilized, the money is "co-invested" alongside public finance in a project, programme or fund as a direct result of the public-sector intervention (Brown et al. 2015:V). This type of finance is generally easier to track, as it happens "at the source" – at the same time or shortly after the provision of public finance. Indirect mobilization of private finance is more difficult to identify, track and account. Here, private investments could result from a public-sector intervention, such as a project preparation grant or technical assistance. Tracing the causal links, however, can be difficult, as the intervention enables outputs that occur one or more steps upstream of the private investment (Brown et al. 2015; Brown et al. 2011).

Private finance for adaptation may be mobilized through interventions that occur upstream in the investment value chain; consequently, existing tracking efforts may not capture all mobilized private finance for adaptation (Ford et al. 2015; Donner et al. 2016). Information about private investment in adaptation remains one of the most important gaps in climate finance tracking, and it is difficult to find evidence of direct and indirect mobilization of private investment (Buchner et al. 2015). The private sector might contribute to adaptation benefits without calling it adaptation, making it hard to identify (Klein et al. 2018; Averchenkova et al. 2016). Thus, the visible level of identifiable private investment in adaptation probably understates the actual activity level (Agrawala et al. 2011; Pauw 2015).

The framework also highlights the possibility that even when launched and implemented, measures identified in Step 1 may not result in private-sector finance being mobilized for adaptation. Private investments in adaptation compete for capital with other investment priorities with lower uncertainties (UNEP 2016) or higher potential internal rates of return. Businesses might also choose to invest in expansion rather than in adaptation, which is more about consolidating existing operations. Thus, creating an enabling environment might not be sufficient to actually mobilize private finance for adaptation.

It is much more difficult to identify whether additional private adaptation is mobilized than it is to identify instruments for enabling environments. For example, Multilateral Development Banks (MDBs) started to report on their mobilised private adaptation investments. MDBs reported that US\$270 million of MDB finance targeting private sector adaptation made US\$1.5 billion of MDB investment more climate-resilient, with a total project portfolio value of \$5.5 billion. However, when assessing this mobilization, Vivid Economics (2015) found that the adaptation components reported by MDBs were mainly additions to existing or previously planned projects. This can raise questions on the actual mobilization power of the instruments used. If the project portfolio funding was pre-agreed, what counts as mobilized? What is mobilized directly and what indirectly? This shows that even for large financial institutions, reporting on mobilization can be challenging.

### Step 3: Delivery of adaptation benefits

Even when an enabling environment instrument is actually applied and achieves behavioural modification through mobilization, it may not necessarily lead to the delivery of adaptation benefits (See Young 2011). The framework is interested in establishing a causal relationship between an effective enabling environment and the problem it manages to solve (see Young 2004). In other words: to what extent is an instrument that successfully mobilizes private finance also delivering adaptation benefits (Figure 1)? Of the three building blocks of the framework, delivery of adaptation benefits is the most difficult to assess. Establishing a causal relationship can be particularly demanding. Private investments in adaptation are often not reported as adaptation, and are therefore hard to track; furthermore, adaptation is a long-term process that does not lend itself to tracking.

Establishing causality is important because the implementation of certain instruments could result in additional barriers for private investment (Naidoo et al. 2012; Berliner et al. 2013), or lead to maladaptation (Juhola et al. 2016; Magnan et al. 2016). Private investments in adaptation can lead to maladaptation and/or increase vulnerability. For example, building a new dam to ensure a steady water supply for a company's operations may reduce the water available to local farmers, or force people in the area to relocate (Magnan et al. 2016; Juhola et al. 2016). Similarly, private flood barriers in one place can exacerbate flood risks elsewhere, as they push the water out in another direction (see Druce et al. 2016).

When it is possible to identify adaptation benefits, it is also important to distinguish between public and private benefits. Private adaptation-related investments do not automatically generate public goods. For example, private investments may be directed to a sector or a location that is not necessarily an adaptation priority for the country or the affected community. To ensure that private climate finance delivers public adaptation benefits, effective instruments require accountability mechanisms that are enforced by the national or local governments (Agarwal et al. 2012; Newell 2008). For public climate finance, all actors, from taxpayers in developed countries, to citizens in the recipient countries, expect a meaningful contribution to achieving public benefits related to climate change activities. The degree to which private investors share common goals with expected beneficiaries of adaptation benefits is not equally clear (Atteridge and Dzebo 2015).

If adaptation benefits contribute to public benefits, they can be counted towards the US\$100 billion climate finance commitment made under the UNFCCC. Discussions on international private adaptation finance first emerged under this target. Criteria for monitoring, reporting and verification (MRV) are being developed for private adaptation finance to be accountable in a consistent, transparent, comparable, complete and accurate manner (UNFCCC 2014; UNEP 2011; Ellis and Moarif 2015). The verification criteria aim to assess benefits, and there have been attempts to develop an MRV system suitable for private investments in adaptation (e.g. Jachnik et al. 2015; Brown et al. 2015). Nevertheless, with the exception of green bonds, most types of traditional private finance instruments (debt and equity) would be very difficult to align with MRV requirements (Atteridge and Dzebo 2015).

### 3. Private adaptation finance in Kenya and Rwanda

This section describes the results of the testing of the framework (see Figure 1) in Kenya and Rwanda based on a literature review, interviews, and two workshops in Nairobi and Kigali. In doing so, it follows the steps of the framework. Data on both case studies was collected through 45 face-to-face, semi-structured interviews with 51 stakeholders, including decision-makers from ministries, agencies, international organizations, the private sector and civil society. Twenty-five of the interviews were held in Rwanda and 20 were held in Kenya. Stakeholders were identified through existing literature, policy documents, cooperation with local partners, and snowballing. The interviews took place in English and took between 45 and 60 minutes. They were transcribed, coded, and analysed qualitatively.

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#### A NOTE ON COUNTRY SELECTION

Kenya and Rwanda were selected because they emphasized the role of the private sector in adaptation in their nationally determined contributions (NDCs) under the Paris Agreement (GoK 2016a; GoR 2016). Both countries also have strong policy environments, with well-developed national development plans and strong relationships with international development partners. In both Kenya and Rwanda, the private sector is split into two weakly connected parts: a formal sector of larger businesses, which is relatively healthy and productive, and a very large informal small business sector, which supports almost nine out of ten workers (excluding agriculture). The informal sector is poorly documented and is not supported by coherent government action (AfDB 2013b). Both countries also face serious risks from climate change. Kenya's natural resource base makes the country highly vulnerable to climate change impacts. On an annual basis, extreme climatic events could cost the economy as much as US\$500 million (SEI 2009a). For Rwanda, floods and droughts cause major socio-economic impacts and hinder growth. By 2030, climate change impacts could amount to 1% of GDP, and it is estimated that Rwanda needs to invest between US\$50 million and US\$300 million per year in adaptation (SEI 2009b; GoR 2015).

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#### 3.1 Enabling environments

The application of the framework demonstrates that both Kenya and Rwanda have developed a broad institutional and regulatory framework for adaptation over the past few years, including the explicit intent to mobilize private finance for climate activities. Donors and international organizations are supportive of the intent but have limited experience themselves. In both countries, there is widespread recognition that the creation of an enabling environment is difficult and that barriers for the mobilization of private investments in adaptation still exist. In contrast, private sector interventions – where one private actor stimulates another to adapt – are so far rare.

Interviewees indicated that international actors help to create enabling environments for private sector adaptation in both countries. In Kenya, international actors have used a combination of instruments. For example, financial instruments have been used by donors like the UK and Denmark. The UK Department for International Development (DFID) used grants to support the formulation of a National Climate Change Action Plan, which includes private sector roles. The Danish International Development Agency (DANIDA) operates a fund where the private sector can apply for up to 80% of grant funding, including for adaptation-related activities. However, at the time of the interview, there had not been any adaptation-related applications. Awareness-raising instruments have also been used in combination with financial instruments. For example, the German Corporation for International Cooperation (GIZ) is actively promoting public-private partnerships (PPPs) in climate projects and programmes, although with a focus

on mitigation rather than on adaptation. The Netherlands Development Organisation (SNV) also uses technology instruments, promoting Dutch technology in various Kenyan sectors to develop adaptation businesses. In Rwanda, GIZ and the development bank KfW are using a combination of economic and technological instruments; specifically, they provide technical assistance and extended credit lines to tea and coffee small and medium-sized enterprises (SMEs) that work with the Rwanda Association of Manufacturers (GIZ 2014). Rwanda has also been awarded readiness support from the Green Climate Fund to help government agencies to better communicate, coordinate and build capacity, and thus attract more international climate finance, including private finance.

Regarding domestic policy instruments, climate change national policies include different measures to incentivize private sector investment in adaptation. In Kenya, the creation of a “Kenya National Climate Fund” (still under development) is expected to catalyse private sector funding and to provide a governance structure composed by government, civil society and private sector representation (GoK 2013; GoK 2016c). The involvement of private actors within the drafting of key policy instruments – such as the National Adaptation Plan and the Climate Change Act – and in the National Climate Change Council is also expected to contribute to a good environment for private investment (GoK 2016c). This is particularly important, as there is a perception from the private sector and development organizations that climate finance is too close to the central government to benefit the private sector. Clarity on the expected private sector roles in specific sectors or actions is also expected to contribute to a good private investment environment. For example, Kenya’s NDC refers to a need to demonstrate an operational business case in trade, manufacturing and financial services (GoK 2016a), and Kenya’s National Adaptation Plan has assigned partial financial and implementation responsibility for 19 out of its 20 adaptation actions (GoK 2016c). Finally, Kenya’s Ministry of Environment and Natural Resources has established a Climate Change Directorate, and various other ministries have established “climate desks”. In Rwanda, private capital leverage for low-carbon and adaptation activities is also an expected result of the implementation of the Green Growth and Climate Resilience: National Strategy for Climate Change and Low Carbon Development (GoR 2011).

Both countries have used domestic economic instruments less frequently. In Kenya, several counties have created their own climate funds, which are structured to blend public and private financial resources and are currently operational (Murphy and Orindi 2017). In Rwanda, FONERWA, the largest national fund for climate change and green growth in Africa, has a mandate to direct at least 20% of its resources to the private sector, mainly through grants and credit lines. Targeted projects are those contributing to the Green Growth and Climate Resilience National Strategy objectives. Respondents from both countries emphasised that both general measures (e.g. promoting investments in research and development) and specific economic instruments were key for unlocking private sector involvement; they suggested measures such as a tax exemption for irrigation equipment, development of green credit lines, and the expansion of mobile banking (e.g. M-Pesa).

Step 1 of the framework maps out policy instruments promoting general private investment – that is, investment not specific to adaption or climate change – to help evaluate the relationship between the public and private sectors. In Kenya, the national development plan, Vision 2030, highlights that the country’s growth strategy is expected to be export-led and private sector-driven; this applies to all six priority sectors and the three pillars of economic, social and political governance (GoK 2007). Almost all international organizations interviewed for this study saw Rwanda’s Vision 2020 (GoR 2000) as encouraging for private investment (including GIZ, the German Development Bank, the U.S. Agency for International Development, the African Development Bank and the Swedish International Development Agency). Some of the mandates from these instruments can help us understand the level of development of the private sector in a specific country. For example, Kenya’s private sector development strategy and implementation plan aims to improve private sector growth and competitiveness (GoK 2005; GoK 2007; AfDB 2013b). In Rwanda, the national private sector strategy requires all ministries and agencies to

identify and engage key private actors in each sector (GoR 2013). This means that the starting point is still engagement, an early precedent for investment.

The framework also helped to identify a lack of public awareness-raising instruments on adaptation that targeted the private sector. In Kenya, interviewees highlighted the need to increase private actors' awareness on adaptation as a precondition for them to invest in adaptation. In fact, some respondents mentioned that this also applies to the public sector, as adaptation is still a relatively new topic on the agenda of most ministries. For example, one interviewee from an international organization said that even when private-sector adaptation within value-chain management is recognized, it has been hardly addressed because adaptation has not been an important issue for ministries of trade or even agriculture. Similarly, no ongoing awareness-raising instruments were identified in Rwanda, despite the fact that representatives from the Rwanda Development Board (RDB), Rwanda Environmental Management Agency (REMA), and the Ministry of Environment (MINIRENA) emphasized that the private sector has low awareness of climate risks and adaptation options.

Private sector interventions, where one private actor stimulates another to adapt, are so far rare. The only identified instruments specifically for adaptation were awareness-raising activities by domestic private actors in Kenya. The Kenya Private Sector Alliance (KEPSA) and the Kenya Association of Manufacturers are investing in efforts to increase public awareness and understanding on adaptation. Interviewees and workshop participants said there is currently little direct, explicit investment in adaptation coming from international businesses.

Two respondents also mentioned private sector interventions that could potentially be linked to adaptation. These interventions focus on high-value export crops, and are led by the Kenya Tea Development Agency, the Coffee Board of Kenya, and the Kenya Flower Council. In these cases, the private sector invests in the improvement of industry quality standards, extension officers' employment, and bad harvests tracking. While there is no specific adaptation component to this effort, export crops are seen as an important source of revenue for both countries and the awareness of climate impacts is high.

Despite the steps taken in Kenya and Rwanda to create enabling environments, there is widespread recognition that the creation of an enabling environment is difficult and that barriers to the mobilization of private investments in adaptation still exist. For example, the Government of Kenya (GoK 2013) notes that “[b]arriers include gaps in policy and legislation, weak institutional capacity, poor management of natural resources, limited private sector involvement, lack of capital and financing, and inadequate access to (...) technology” (GoK, 2013:40; see also Crick et al. 2016). An interviewed employee of FONERWA noted that Rwanda, and many governments in Sub-Saharan Africa, have limited internal capacity to channel large amounts of finance to adaptation projects on the ground, including those allocated to the private sector. This low capacity for disbursement of finance may disincentivize private sector actors to apply for funding.

### 3.2 Mobilization

Enabling environments created by the public sector are expected to mobilize additional private investments that could contribute to adaptation (see Figure 1). After applying the framework in Kenya and Rwanda, enabling environment instruments seem to have a limited effect on both direct and indirect mobilization of investments in adaptation. Direct mobilization may be hampered by several identified factors, including the lack of implementation or enforcement of existing instruments, absence of publicly available information on private investments, lack of alignment between international private finance and adaptation priorities, and lack of labelling and tracking of private adaptation investments. Indirect mobilization is likely hindered by the nature of this type of investment, which is often in-kind or technological and difficult to track and aggregate.

In spite of the limited information available, a few notable cases of direct mobilization were identified, as a result of both international and domestic interventions. In Kenya, international public funding led to private investments in the development of organic fertilisers to support environmentally friendly crop protection products. The Kenya Climate Innovation Center (KCIC) – a donor-supported incubation centre for new small and medium-sized enterprises (SMEs) working on climate action – provided 50,000 Kenyan shillings (about US\$500) in seed funding to Kenya Biologics, which later successfully attracted private equity from a Dutch firm (Pauw and Dzebo, 2016). While KCIC promoted this project as successful direct mobilization of private finance for adaptation, the amount of mobilized investment is unknown, and the adaptation benefits are not monitored or reported.

In Rwanda, of all existing FONERWA activities, only one project has mobilized private investments in adaptation. A consortium that comprises a ministry (MINIRENA), a bank and a manufacturer of water storage tanks worked on a project for rooftop rainwater harvesting. The interviewed project partners all considered this project a success. However, the financial actor, a bank that provided subsidised loans, saw its participation in the project as corporate social responsibility (CSR) rather than a bankable investment (Dzebo and Pauw 2016). The interviewed bank official argued that even though the bank made a profit on its engagement, the alternative cost was high, as its profits would have been higher if it had not worked with smallholder farmers.

In addition, several interviewees from civil society in both Kenya and Rwanda referred to the lack of implementation of existing public policies as a key barrier to private sector mobilization. For example, farmers still grow crops close to rivers and on slopes, and thus contribute to further land degradation and increasing vulnerability, despite the government's ambition to regulate these practices (GoR 2009). And, in Kenya, it was noted that despite the efforts of extension services to promote crop diversification, many farmers still do monocropping (GoK 2017)

The extent of which private sector interventions mobilize additional private finance for adaptation is unclear. Multiple interviewees in both Rwanda and Kenya mentioned that there is a lack of quantitative evidence on this topic. Private actors do not necessarily label their activities as adaptation (even if they are), and therefore do not keep track of adaptation-related investments. This is true particularly for micro, small, and medium-sized enterprises (MSMEs) (Brown et al. 2015; Buchner et al. 2015; Pauw 2015), as well as large-scale investments in sectors relevant to adaptation, including climate-smart agriculture, social entrepreneurship, ecotourism and improved water management (see Klein et al. 2018; Averchenkova et al. 2016).

In addition, direct investments in Kenya and Rwanda by international private sector actors do not prioritise climate-relevant sectors. Both countries have been successful in mobilizing foreign direct investment (FDI), with Kenya receiving US\$672 million and Rwanda receiving US\$293 million in 2016 (UNCTAD 2018). However, FDI has gone entirely to sectors that are less of a priority for adaptation. In Rwanda, that has included financial services, information and communications technology (ICT), and manufacturing (GoR 2017); in Kenya, FDI has gone to sectors such as ICT and renewable energy (GoK 2016b).

The amount of indirectly mobilized private sector investments with adaptation benefits remains unclear. Several respondents from international development agencies and international organizations noted that private sector in-kind or technology contributions, as well as corporate social responsibility, could be seen as indirect mobilization. Yet these are difficult to track, quantify and aggregate in monetary terms. For example, in Rwanda, 37% of the projects in the FONERWA portfolio are led by the private sector, with most private sector contributions focused on mitigation and presented in the form of in-kind or technology transfer actions. Though FONERWA also supports adaptation projects, these are usually managed by government agencies or civil society.

### 3.3 Delivery of finance for adaptation benefits

Mobilized adaptation investments don't necessarily lead to adaptation. Furthermore, a lack of knowledge and experience with adaptation, or a narrow focus on self-interest, may lead the private sector to invest in counterproductive measures, known as maladaptation. Using the framework in Kenya and Rwanda resulted in only anecdotal evidence of private investments that created adaptation benefits or caused maladaptation. It is therefore uncertain to what extent enabling environments and mobilized investment have contributed to adaptation. There are no indicators in place to measure adaptation benefits, and, thus, they are not being monitored or reported. Therefore, it is difficult, if not impossible, to identify the private sector's contribution to the US\$100 billion target for climate finance. This was the case both for explicit adaptation projects and for investments that could contribute to adaptation indirectly.

This lack of robust evidence on adaptation contributions can be explained partially by current mandatory systems for private investment, which do not include explicit criteria to measure adaptation effects. For example, in Kenya, the National Environment Management Authority (NEMA) currently does not include adaptation criteria in required environmental impact assessments (EIAs). The Rwanda Development Board (which facilitates private investments, both domestic and foreign) similarly requires EIAs for most projects; however, there are no specific requirements for adaptation. During the workshops in both Rwanda and Kenya, participants broadly agreed that adaptation criteria in EIAs – on water and land use, for instance – would reduce maladaptation and increase adaptation benefits.

This is important because adaptation benefits can arise from a broad set of sources. Some investments that contribute to adaptation – by reducing poverty or making natural resource use more sustainable – are not motivated by climate concerns. Interviewees in Rwanda pointed to an initiative to restore the Rugezi watershed, which delivered adaptation as a co-benefit. After a 2004 electricity crisis, the government's objective was to restore and increase the generation capacity of the Ntaruka power station; the hydropower plant was experiencing a steep capacity decline, due in part to poor management of the upstream wetlands and degradation of the surrounding watershed. Stronger enforcement of existing policies brought substantial environmental benefits, both for the public and private sectors, but it also restored and increased Ntaruka's generation capacity, and made the facility more resilient to the future changes in rainfall expected as a result of climate change (Hove et al. 2011).

Achieving no adaptation with mobilized funding is also a risk. Respondents from civil society and from the Rwandan government identified the risk of "climate-washing". This can happen when private-sector projects are misidentified as serving adaptation because they fit with the prevailing climate discourse or agenda. In the past, government or NGO-sponsored projects without clear adaptation benefits have been labelled as "adaptation" because it increased the chances of getting international funding (Ireland 2012).

The lack of monitoring of adaptation could also bring maladaptation risks. Four respondents from the civil society, development, and research sectors stated that private maladaptation is currently a blind spot. Two additional respondents stated that there should be instruments to prevent private maladaptation. Respondents voiced concerns about the possibility of private sector investments in adaptation in one place increasing vulnerability elsewhere. For example, if a company protects its water supply, it might either benefit communities (if increased water efficiency makes more water available to communities) or harm them (if the company secures its water intake at the cost of others' access to water). Maladaptation could also happen when actors without sound experience or knowledge of adaptation manage adaptation programmes (Mustelin et al. 2013).

During the workshops in both Rwanda and Kenya, participants also mentioned that international interventions could lead the way for monitoring the delivery of adaptation benefits. For example, the Green Climate Fund (GCF), a major actor in international climate finance, could put adaptation

criteria in its own guidelines for project implementation. This might provide an incentive to monitor and quantify investments in adaptation, including in the private sector. Whereas funding from the GCF is available for private actors and for adaptation, currently only one private project (for off-grid solar) has been approved for Kenya and Rwanda and it is focused on mitigation (GCF 2015).

Lastly, during the interviews and the workshop, it became clear that private investments will not cover certain sections of society. For example, in agriculture, the private sector is interested in index insurance for farmers that can afford it, but not in promoting climate-smart agriculture for the larger number of more vulnerable subsistence farmers (see also Sibiko et al. 2018). Interviewed private sector actors raised the concern that many actions that reduce climate risks, such as conservation, ecosystem restoration, capacity building and education, do not produce immediate economic benefits. Indeed, many benefits of adaptation measures are difficult to measure in economic terms and are perceived as part of the public realm (Sovacool et al. 2015). This issue is not only relevant to the private sector: even within ministries, a former MINIRENA employee in Rwanda said it was a problem to constantly have to show how a project or an initiative contributed to GDP to get a budget allocation.

During the workshop in Nairobi in particular, respondents also questioned why the US\$100 billion in climate finance was included in the framework. For them, climate finance as negotiated under the UNFCCC has hardly sparked the private sector's interest to date. In Kenya, private sector actors noted that they are the users and implementers of adaptation interventions, not financiers that contribute to the US\$100 billion.

## 4. Strengths and weaknesses in current practices for mobilizing private finance for adaptation in Kenya and Rwanda

Despite the differences between Kenya and Rwanda, the framework was easily applicable in both countries. The testing of the framework highlights the strengths and weaknesses in each country, in terms of current practices for mobilizing private sector finance for adaptation.

The framework demonstrates that both Kenya and Rwanda have a strong focus on public policy and regulatory instruments to mobilize private investments, both for adaptation and for more general purposes. Beyond the role of national governments, international actors operating in Kenya and Rwanda – including bilateral agencies, international organizations and multilateral development banks – generally support the concept of private finance mobilization, but have limited experience themselves with mobilizing private finance for adaptation. Only one actor, GIZ in Rwanda, targets private sector adaptation.

Economic instruments have not been widely used, but there is a recognition that more of these instruments are required and that the financial sector needs to be more actively involved. Currently, the financial sector in both countries is investing an increasing amount in mitigation activities, such as clean cookstoves and solar energy, but not in adaptation-related products (e.g. bio-fertilisers and irrigation equipment).

A lack of awareness-raising instruments was also identified. In line with earlier research (see Pauw 2015; Druce et al. 2016), the interviews and workshops demonstrate that one of the key challenges is that adaptation is an abstract and alien concept to the private sector. This might be a communication issue: the private sector might invest in reducing risks from climate-related hazards without knowing it is adapting to climate change. However, it also makes private sector contributions to adaptation invisible (see Agrawala et al. 2011) and creates a barrier for effective cooperation and communication between private and public actors. Capacity building, awareness campaigns, and information-sharing are pre-conditions for private adaptation investments

and should be provided by both the domestic public sectors and the international community. Public actors can cooperate with civil society and build on their experience in adaptation and capacity-building (Druce et al. 2016). Whereas private sector awareness of climate change impacts is particularly relevant for creating enabling environments, their impact is difficult to measure under this framework.

For this reason, it usually remains unclear to what extent enabling environments lead to the actual mobilization (Step 2) of private investments in adaptation. Adaptation labelling or reporting of private investment is not a common practice by private actors. Identified contributions from the private sector have been mostly in-kind contributions and technology transfer; thus, they are difficult to quantify and aggregate. Furthermore, governments in both countries put too little effort into enforcing or monitoring existing policies or regulations aimed at promoting private investment in adaptation. Meanwhile, international private finance through foreign direct investment (FDI) remains a “black box” for adaptation, as it is not transparent. It is therefore difficult to assess where the money is going beyond large sectoral categories. Governments and international organizations can put more explicit emphasis on adaptation by integrating it into existing strategies and making adaptation a key component of their work.

It is unclear whether mobilized investment effectively delivers adaptation benefits, or if it increases vulnerability through maladaptive practices, perhaps with the exception of corporate social responsibility (CSR) contributions (Step 3). Based on the framework, this paper demonstrates that private adaptation investments are not tracked. The creation of a tracking system might be complicated, given the variety of sectors, timescales and spatial scales involved (Christiansen and Martinez 2018; Leiter and Pringle 2018). However, financial instruments that are specialised for adaptation, such as risk guarantees and green bonds, could help to ensure that mobilized private finance in developing countries have an impact (Sida 2016).

Based on this research, we recommend incorporating adaptation components into EIAs, to ensure the monitoring and reporting of private contributions that have an indirect effect on adaptation. Doing so would help to prevent maladaptation, while maximizing the positive contributions to adaptation. In addition, international actors can also develop indicators for increasing the role of the private sector in their projects. Both measures could increase public and private investments in adaptation activities and also help raise awareness of climate risks and adaptation options.

Finally, given the demonstrated knowledge gap on the delivery of adaptation benefits, it remains unknown whether private finance contributions could contribute to the US\$100 billion climate finance target (Pauw et al. 2015). Although this is an important issue for the UN climate negotiations, this research demonstrated that the topic is too far off from current realities on the ground to draw any meaningful conclusions.

## 5. Conclusion

In developing countries in particular, adaptation needs and costs far exceed what the public sector can finance and achieve. It is therefore crucial to engage the private sector in adaptation, and many countries already aim to do so. However, given the variety of sectors, climate impacts, uncertainties and governance levels involved, it is extremely complex to get an overview of private investments that contribute to adaptation. To address this, this paper presented an empirically driven framework to more easily understand the process of mobilizing private investments in adaptation, and to identify strengths and weaknesses in current practices. The framework is not meant as a tool to help countries mobilize as much private investment as possible. Instead, it aims to identify current shortcomings and the overall limits of mobilizing private investments with adaptation benefits. This, in turn, could help governments to make the right decisions on how to reduce the vulnerability of their people and economies.

Our framework has three big advantages. First, by structuring complex discussions around the mobilization of private investments in effective adaptation, it helps to identify countries' strengths and weaknesses. Second, the framework can stimulate a debate on how enabling environments can be unsuccessful, how mobilization of investments might fail, and of how private investments can cause maladaptation. These issues are so far hardly addressed in literature and policy debates. Third, the framework can help to shift the focus from stimulating action (through an enabling environment) towards stimulating successful adaptation (through monitoring and reporting, and enforcement in general). Enabling environments are only a means to an end, and not an end in itself.

We believe this framework can be used to identify countries' strengths and weaknesses, as well as the potential to mobilize private investments in adaptation. Because the framework is so simple and straightforward, it can be used by civil society, public servants, researchers and others to generate a general overview fairly quickly. At the same time, this simplicity is also a weakness. The framework could be used for more detailed analysis either by adding parameters and better defined and measurable variables for each step, or by focussing on specific (sub)sectors or levels of governance, and potentially adapting the framework for this purpose. For example, the implications of climate change for the mining sector are completely different from those faced by agricultural enterprises. The implications can be wide-ranging within sectors; for example, as this paper shows, there are large differences and opportunities even within the agricultural sector when looking at how private actors can contribute to adaptation.

## 6. References

- AfDB (2013a). *Supporting the transformation of the private sector in Africa*. African Development Bank Group, Tunis. [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/2013-2017\\_-\\_Private\\_Sector\\_Development\\_Strategy.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Policy-Documents/2013-2017_-_Private_Sector_Development_Strategy.pdf)
- AfDB (2013b). *The State of Kenya's Private Sector. Recommendations for Government, Development Partners and the Private Sector*. African Development Bank Group, Tunis. [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/The\\_State\\_of\\_Kenya\\_s\\_Private\\_Sector\\_-\\_Recommendations\\_for\\_Government-Development\\_Partners\\_and\\_the\\_Private\\_Sector.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/The_State_of_Kenya_s_Private_Sector_-_Recommendations_for_Government-Development_Partners_and_the_Private_Sector.pdf)
- Agrawala, S., Carraro, M., Kingsmill, N., Lanzi, E. and Prudent-Richard, G. (2011). *Private Sector Engagement in Adaptation to Climate Change: Approaches to Managing Climate Risks*. OECD Environment Working Paper No 39. Organisation for Economic Co-operation and Development, Paris.
- Agarwal, A., Perrin, N., Chhatre, A., Benson, C. S. and Kononen, M. (2012). Climate policy processes, local institutions, and adaptation actions: mechanisms of translation and influence. *Wiley Interdisciplinary Reviews: Climate Change*, 3(6), 565–579. DOI: 10.1002/wcc.193
- Ampaire, E. L., Jassogne, L., Providence, H., Acosta, M., Twyman, J., Winowiecki, L. and Van, A. P. (2017). Institutional challenges to climate change adaptation: a case study on policy action gaps in Uganda. *Environmental Science and Policy*, 75, 81–90. DOI: 10.1016/j.envsci.2017.05.013
- Atteridge, A. and Dzebo, A. (2015). *When Does Private Finance Count as Climate Finance? Accounting for Private Contributions Towards International Pledges*. Discussion Brief. Stockholm Environment Institute, Stockholm. <https://www.sei.org/publications/when-does-private-finance-count-as-climate-finance-accounting-for-private-contributions-towards-international-pledges/>
- Averchenkova, A., Crick, F., Kocornik-Mina, A., Leck, H. and Surminski, S. (2016). Multinational and large national corporations and climate adaptation: are we asking the right questions? A review of current knowledge and a new research perspective. *Wiley Interdisciplinary Reviews: Climate Change* 7, 517–536. DOI:10.1002/wcc.402
- Berliner, J., Grüning C., Kempa, K., Menzel, C. and Moslener, U. (2013). *Addressing the Barriers to Climate Investment*. Policy Brief. Climate & Development Knowledge Network, Cape Town.
- Biagini, B. and Miller, A. (2013). Engaging the private sector in adaptation to climate change in developing countries: importance, status, and challenges. *Climate and Development*, 5(3), 242–252. DOI: 10.1080/17565529.2013.821053
- Biermann, F., Pattberg, P., van Asselt, H. and Zelli, F. (2009). The fragmentation of global governance architectures: a framework for analysis. *Global Environmental Politics*, 9, 14–40. DOI: 10.1162/glep.2009.9.4.14
- Brink E, Aalders T, Adam D, et al. (2016) Cascades of green: a review of ecosystem-based adaptation in urban areas. *Global Environmental Change*, 36: 111–123. DOI: 10.1016/j.gloenvcha.2015.11.003
- Brown, J., Stadelmann, M., Wang, D., Boni, L., Jachnik, R. and Kato, T. (2015). *Estimating Mobilized Private Finance for Adaptation: Exploring Data and Methods*. Climate Policy Initiative and Organisation for Economic Co-operation and Development, San Francisco and Paris.
- Brown, J., Buchner, B., Wagner, G., and Sierra, K. (2011). *Improving the Effectiveness of Climate Finance: A Survey of Leveraging Methodologies*. Climate Policy Initiative, San Francisco. <https://climatepolicyinitiative.org/wp-content/uploads/2011/11/Effectiveness-of-Climate-Finance-Methodology.pdf>
- Buchner, B., Trabacchi, C., Mazza, F., Abramskiehn, D. and Wang, D. (2015). *The Global Landscape of Climate Finance 2015*. Climate Policy Initiative, San Francisco.
- Bulkeley, H., Andonova, L.B., Betsill, M.M., Compagnon, D., Hale, T., Hoffmann, M.J., Newell, P., Paterson, M., Roger, C. and VanDeveer, S.D. (2014). *Transnational Climate Change Governance*. 1st edition. Cambridge University Press, New York.
- Chan, S., Falkner, R., Goldberg, M., and van Asselt, H. (2018). Effective and geographically balanced? An output-based assessment of non-state climate actions. *Climate Policy*, 18(1), 24–35. DOI: 10.1080/14693062.2016.1248343
- Christiansen, L. and Martinez, G. (2018). Editorial. In *Adaptation metrics: Perspectives on measuring, aggregating and comparing adaptation results*. Christiansen, L., Martinez, G. and Naswa, P. (eds). UNEP DTU Partnership, Copenhagen.
- Crick, F. Gannon, E. K., Diop, M. and Sow, M. (2018a). Enabling private sector adaptation to climate change in sub-Saharan Africa. *WIREs Climate Change*, 9 (2). DOI: 10.1002/wcc.505.
- Crick, F., Eskander, S. M. S. U., Fankhauser, S., and Diop, M. (2018b). How do African SMEs respond to climate risks? Evidence from Kenya and Senegal. *World Development*, 108, 157–168. DOI: 10.1016/j.worlddev.2018.03.015

- Crick, F., Diop, M., Sow, M., Diouf, B., Diouf, B., Muhwanga, J. and Dajani, M. (2016). *Enabling Private Sector Adaptation in Developing Countries and Their Semi-Arid Regions – Case Studies of Senegal and Kenya*. Working Paper. Centre for Climate Change Economics and Policy, and Grantham Research Institute on Climate Change and the Environment, Leeds and London.
- Donner, S. D., Kandlikar, M. and Webber, S. (2016). Measuring and tracking the flow of climate change adaptation aid to the developing world. *Environmental Research Letters*, 11(5), 054006. DOI: 10.1088/1748-9326/11/5/054006
- Druce, L., Moslener, U., Gruening, C., Pauw, W. P., and Connell, R. (2016). *Demystifying Adaptation Finance for the Private Sector*. UNEP, Federal Ministry for Economic Cooperation and Development, UNEP Finance Initiative, GiZ. November 2016.
- Dzebo, A., and Pauw, P., (2016). *Mobilizing private finance: Unlocking the potential of Rwanda’s businesses to drive climate change adaptation (SEI policy brief)*. Stockholm Environment Institute, Stockholm.
- Easton, D. (1965). *A systems analysis of political life*. John Wiley and Sons Ltd, New York.
- Ellis, J. and Moarif, S. (2015). *Identifying and Addressing Gaps in the UNFCCC Reporting Framework*. OECD/IEA Climate Change Expert Group Papers, No. 2015/07. Organisation for Economic Co-operation and Development, Paris. DOI: 10.1787/5jm56w6f918n-en
- Ford, J.D., Berrang-ford, L., Biesbroek, R., Araos, M., Austin, S.E. and Lesnikowski, A. (2015). Adaptation tracking for a post-2015 climate agreement. *Nature Climate Change*, 5, 967–969. DOI: 10.1038/nclimate2744
- GCF (2015). *Funding Proposal FP005: Kawisafi Ventures Fund*. Decision B.11/11. Green Climate Fund, Songdo.
- Geaves, L.H. and Penning-Rowsell, E.C. (2016). Flood risk management as a public or a private good, and the implications for stakeholder engagement. *Environmental Science & Policy* 55(2). 281–291. Nordic Council of Ministers, Copenhagen. DOI: 10.1016/j.envsci.2015.06.004
- GiZ (2014). *Baseline Study on Climate Change Impacts on the Private Sector in Rwanda*. Gesellschaft für international Zusammenarbeit (GiZ) and aDelphi, Eschborn and Berlin.
- Global Commission on the Economy and Climate (2016). *The Sustainable Infrastructure Imperative: Financing for Better Growth and Development*. New Climate Economy, Washington, DC, and London.
- GoK (2005). *Private Sector Development Strategy 2006-2010*. Government of Kenya, Nairobi.
- GoK (2007). *Vision 2030*. Government of Kenya, Nairobi.
- GoK (2013). *National Climate Change Action Plan 2013-2017*. Government of Kenya, Nairobi.
- GoK (2016a). *Kenya’s Intended Nationally Determined Contribution (INDC)*. Ministry of Environment and Natural Resources, Government of Kenya, Nairobi.
- GoK (2016b). *Foreign Investment Survey 2016 Report*. Kenya National Bureau of Statistics, Government of Kenya, Nairobi.
- GoK (2016c). *Kenya National Adaptation Plan 2015-2030*. Government of Kenya, Nairobi.
- GoK (2017). *Capacity Building Strategy for the Agriculture Sector*. Ministry of Agriculture, Livestock and Fisheries, Government of Kenya, Nairobi.
- GoR (2000). *Rwanda Vision 2020*. Ministry of Finance and Economic Planning, The Republic of Rwanda, Kigali
- GoR (2009). *Strategic Plan for the Transformation of Agriculture in Rwanda – Phase II (PSTA II)*. Ministry of Agriculture and Animal Resources, The Republic of Rwanda, Kigali.
- GoR (2011). *Green Growth and Climate Resilience – National Strategy for Climate Change and Low Carbon Development*. The Republic of Rwanda, Kigali.
- GoR (2013). *Economic Development and Poverty Reduction Strategy 2012-2018 (EDPRS2)*. The Republic of Rwanda, Kigali.
- GoR (2015). *Baseline Climate Change Vulnerability Index for Rwanda*. Rwanda Environment Management Authority, The Republic of Rwanda, Kigali.
- GoR (2016). *Intended Nationally Determined Contribution for the Republic of Rwanda*. The Republic of Rwanda, Kigali.
- GoR (2017). *Foreign Private Capital in Rwanda*. National Bank of Rwanda, The Republic of Rwanda, Kigali.
- Hall, N. and Persson, Å. (2017). Global climate adaptation governance: Why is it not legally binding? *European Journal of International Relations*, 24 (3). 540–566. DOI: 10.1177/1354066117725157
- Hove, H., Parry, J-O. and Lujara, N. (2011). *Maintenance of Hydropower Potential in Rwanda Through Ecosystem Restoration*. World Resources Report, Washington, DC.

- IPCC (2018). Summary for Policymakers. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty*. Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, Maycock, M. Tignor, and T. Waterfield (eds.). World Meteorological Organization, Geneva.
- Ireland, P. (2012). Climate change adaptation: business-as-usual aid and development or an emerging discourse for change? *International Journal of Development Issues*, 11(2), 92-110.
- Jachnik, R., Caruse, R. and Srivastava, A. (2015). *Estimating Mobilised Private Climate Finance*. OECD Environment Working Papers No. 83. Organisation for Economic Co-operation and Development, Paris. DOI: 10.1787/5js4x001rqf8-en
- Jensen N., Barrett, B. C. and Mude, G. A. (2017). Cash transfers and index insurance: a comparative impact analysis from northern Kenya. *Journal of Development Economics*, 129. DOI: 10.2139/ssrn.2547660
- Jordan, A. (2008). The governance of sustainable development: taking stock and looking forwards. *Environment and Planning C: Government and Policy*, 26(1), 17–33. DOI: 10.1068/cav6
- Juhola, S. (2013). Adaptation to climate change in the private and the third sector: case study of governance of the Helsinki Metropolitan region. *Environment and Planning C: Politics and Space*, 31(5), 911–925.
- Juhola, S., Glaas, E., Linnér, B.-O. and Neset, T.-S. (2016). Redefining maladaptation. *Environmental Science & Policy*, 55, 135–140. DOI: 10.1016/j.envsci.2015.09.014
- Klein, J., Juhola, S. and Landauer, M., (2018). Local authorities and the engagement of private actors in climate change adaptation. *Environment and Planning C: Politics and Space*, 35(6), 1055–107. DOI: 10.1177/0263774X16680819
- Leiter, T. and Pringle, P. (2018). Pitfalls and Potential of Measuring Climate Change Adaptation Through Adaptation Metrics. In *Adaptation Metrics: Perspectives on Measuring, Aggregating and Comparing Adaptation Results*. UDP Perspectives Series 2018/1. UNEP DTU Partnership, Copenhagen.
- Magnan, A.K., Schipper, E.L.F., Burkett, M., Bharwani, S., Burton, I., Eriksen, S., Gemenne, F., Schaar, J. and Ziervogel, G. (2016). Addressing the risk of maladaptation to climate change. *Wiley Interdisciplinary Reviews: Climate Change*, 7, 646–665. DOI:10.1002/wcc.409
- Miles, E. L., Andresen, S., Carlin, E. M., Skjaereth, J. B., Underdal, A. and Wettstad, J. (2001). *Environmental Regime Effectiveness: Confronting Theory with Evidence*. MIT Press, Cambridge.
- Murphy, D. and Orindi, V. (2017). *sNAPshot: Kenya's County Climate Change Funds*. NAP Global Network, International Institute for Sustainable Development, Winnipeg.
- Mustelin, J., Kuruppu, N., Kramer, A. M., Daron, J., de Bruin, K. and Noriega, A. G. (2013). Climate adaptation research for the next generation. *Climate and Development*, 5(3), 189–193.
- Naidoo, T., Vaz, K. and Byaba, L. (2012). *CTI PFAN Background Paper on Adaptation: An Introduction to Adaptation in View of Developing a Private Financing Approach for Adaptation Related Projects Using the CTI PFAN Model*. Climate Technology Initiative.
- Newell, P. (2008). Civil society, corporate accountability and the politics of climate change. *Global Environmental Politics*, 8(3), 122–153.
- Pauw, W.P. (2015). Not a panacea: private-sector engagement in adaptation and adaptation finance in developing countries. *Climate Policy*, 15, 583–603. DOI:10.1080/14693062.2014.953906
- Pauw, W.P. (2017). Mobilising private adaptation finance: developed country perspectives. *International Environmental Agreements: Politics, Law and Economics*, 17, 55–71. DOI:10.1007/s10784-016-9342-9
- Pauw, P. and Dzebo, A. (2016). *Private Finance for Climate-Change Adaptation: Challenges and Opportunities for Kenya*. Briefing Paper 22/2016. German Development Institute, Bonn.
- Pauw, W.P., Klein, R.J.T., Vellinga, P. and Biermann, F. (2016). Private finance for adaptation: do private realities meet public ambitions? *Climatic Change*, 134, 489–503. DOI:10.1007/s10584-015-1539-3
- SEI (2009a). *Economics of Climate Change Kenya*. Project Report. Stockholm Environment Institute, Oxford, UK. <https://www.sei.org/mediamanager/documents/Publications/SEI-ProjectReport-Downing-EconomicsOfClimateChangeKenya-2009.pdf>
- SEI (2009b). *Economics of Climate Change in Rwanda*. Project Report. Stockholm Environment Institute, Oxford. [https://mediamanager.sei.org/documents/Publications/Climate/cc\\_economics\\_rwanda.pdf](https://mediamanager.sei.org/documents/Publications/Climate/cc_economics_rwanda.pdf)
- Sibiko, K. W., Veettil, P. C. and Qaim, M. (2018). Small farmers' preferences for weather index insurance: insights from Kenya. *Agriculture & Food Security*, 7(1). DOI: 10.1186/s40066-018-0200-6
- Sida (2016). *Evaluation of Sida's use of Guarantees for Market Development and Poverty Reduction – Evaluation report*. Carnegie Consult Sida Evaluation: 2016:1. Swedish International Development Agency, Stockholm.

- Sovacool, B.K., Linnér, B. and Goodsite, M.E. (2015). The political economy of climate adaptation. *Nature Climate Change*, 5, 616–618. DOI: <http://dx.doi.org.ezp.sub.su.se/10.1038/nclimate2665>.
- Stenek, V., Amado, J.-C. and Greenall, D. (2013). *Enabling Environment for Private Sector Adaptation: An Index Assessment Framework*. International Finance Corporation, Washington, DC.
- Treib, O., Bähr, H. and Falkner, G. (2007). Modes of governance: towards a conceptual clarification. *Journal of European Public Policy*, 14(1), 1–20. DOI: 10.1080/135017606061071406
- UNCTAD (2018). *World Investment Report 2018: Investment and New Industrial Policies*. United Nations Conference on Trade and Development, Geneva.
- UNEP (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. United Nations Environment Programme, Nairobi. [www.unep.org/greeneconomy](http://www.unep.org/greeneconomy)
- UNEP (2016). *The Adaptation Finance Gap Report 2016*. United Nations Environment Programme, Nairobi.
- UNFCCC (2009). *The Copenhagen Accord*. United Nations Framework Convention on Climate Change, Bonn.
- UNFCCC (2014). *Handbook on Measurement, Reporting and Verification for Developing Country Parties*. United Nations Framework Convention on Climate Change, Bonn.
- UNFCCC (2015). *Adoption of the Paris Agreement*. United Nations Framework Convention on Climate Change, Bonn.
- Vivid Economics (2015). *Building an Evidence Base on Private Sector Engagement in Financing Climate Change Adaptation*. Report prepared for European Bank for Reconstruction and Development (EBRD). Vivid Economics, London.
- Young, O.R. (2004). Institutions and the growth of knowledge: evidence from international environmental regimes. *International Environmental Agreements*, 4(2), 215–228.
- Young, O.R. (2011). Effectiveness of international environmental regimes: existing knowledge, cutting-edge themes, and research strategies. *PNAS*, 108(50), 19853–19860. DOI: 10.1073/pnas.1111690108

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